

## Geometry Chapter 4 Practice Test

- C 1 Two vertical angles are also complementary. What is the measure of one of the two vertical angles?
- A.  $90^\circ$  C.  $45^\circ$   
 B.  $50^\circ$  D.  $25^\circ$

$$\begin{aligned} x + x &= 90 \\ 2x &= 90 \\ x &= 45^\circ \end{aligned}$$

- C 2 The area of a square is 16 square units. What is the perimeter?
- A. 4 units C. 16 units  
 B. 8 units D. 32 units

$$\begin{aligned} \boxed{16} \quad s^2 &= 16 \\ s &= 4 \end{aligned}$$

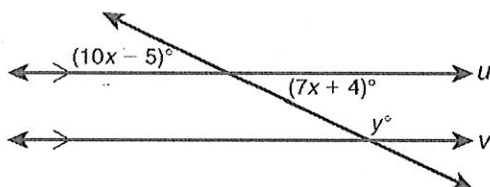
$$P = 4s = 4(4) = 16$$

- A 3 The midpoint of a segment is  $(-8, 5)$ . If one endpoint is  $(0, 1)$ , what is the other endpoint?
- A.  $(-16, 9)$  C.  $(-4, 2)$   
 B.  $(8, -3)$  D.  $(-4, 3)$

$$\begin{aligned} -8 &= \frac{x+0}{2} & 5 &= \frac{y+1}{2} \\ -16 &= x+0 & 10 &= y+1 \\ x &= -16 & y &= 9 \end{aligned}$$

- A 4 Which is a counterexample of the statement?  
 If an animal has wings, then it can fly.
- A. penguin C. duck  
 B. robin D. rabbit

- D 5 If  $u \parallel v$ , what is the value of  $y$ ?



- A. 58  
 B. 122

- C. 142  
 D. 155

$$\begin{aligned} 10x - 5 &= 7x + 4 \\ 3x &= 9 \\ x &= 3 \end{aligned}$$

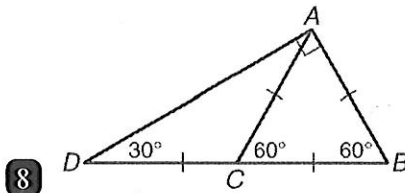
$$\begin{aligned} 7x + 4 + y &= 180 \\ 7(3) + 4 + y &= 180 \\ 21 + 4 + y &= 180 \\ 25 + y &= 180 \\ y &= 155 \end{aligned}$$

- 6 Identify and describe the transformation:

$M: (x, y) \rightarrow (-x, y)$  Reflection over  $y$ -axis

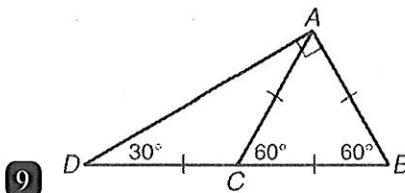
- 7 Prove that triangles  $F(4, 6)$ ,  $G(5, 7)$ ,  $H(7, 4)$  and  $J(1, -4)$ ,  $K(2, -5)$ ,  $L(4, -2)$  are congruent.

$(x, y) \rightarrow (x, -y)$  (Reflection over  $x$ -axis)  
 $(x, y) \rightarrow (x-3, y+2)$  (Translation 3 left & 2 up)



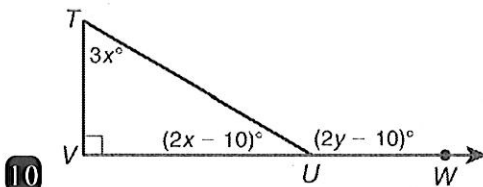
Equiangular / Acute

Classify  $\triangle ABC$  by angle measures.



Scalene

Classify  $\triangle ABD$  by side lengths.



What is  $m\angle T$ ?

$$3x + 2x - 10 = 90$$

$$5x - 10 = 90$$

$$5x = 100$$

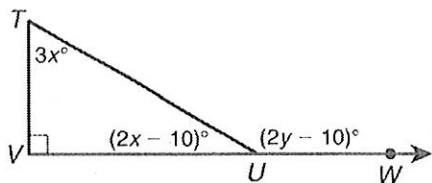
$$x = 20$$

$$m\angle T = 3x$$

$$3(20)$$

$$\boxed{60^\circ}$$

11

What is the value of  $y$ ?

$$\begin{aligned} 2y - 10 &= 90 + 60 \\ 2y &= 150 \\ 2y &= 160 \\ y &= 80 \end{aligned}$$

- 12 Given
- $\triangle QRS \cong \triangle STQ$
- ,
- $\angle R = 4x^2 - 4$
- , and
- $\angle T = 3x^2 - 3x$
- . What is
- $m\angle R$
- ?

$$\begin{aligned} 4x^2 - 4 &= 3x^2 - 3x \\ x^2 + 3x - 4 &= 0 \\ (x+4)(x-1) &= 0 \end{aligned}$$

$$\begin{aligned} x &= -4 \text{ or } x = 1 \\ m\angle R &= 4(-4)^2 - 4 \\ &= 4(16) - 4 \\ &= 64 - 4 = 60^\circ \end{aligned}$$

$$\begin{aligned} 4(1)^2 - 4 \\ 4 - 4 \\ 0 \end{aligned}$$

Not possible

- 13 Given
- $\triangle QRS \cong \triangle STQ$
- ,
- $RS = 3x - 3$
- ,
- $TQ = 2x + 2$
- , and
- $QR = x^2 - 2$
- . What is the length of side
- $ST$
- ?

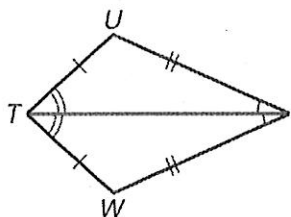
$$\begin{aligned} RS &= TQ \\ 3x - 3 &= 2x + 2 \\ x &= 5 \end{aligned}$$

$$\begin{aligned} QR &= x^2 - 2 \\ 25 - 2 \\ 23 \end{aligned}$$

$$QR = ST$$

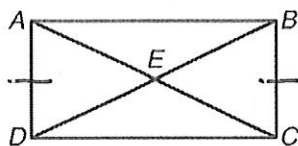
$$ST = 23$$

- 14 Prove
- $\triangle TUV \cong \triangle TWV$
- by using the definition of congruent triangles.



Statement	Reason
$TU \cong TW$ , $UV \cong WV$	Given
$\angle UTV \cong \angle WTV$	Reflexive
$TV \cong TV$	3rd angle theorem
$\triangle TUV \cong \triangle TWV$	Def. of $\cong$ $\Delta$ 's

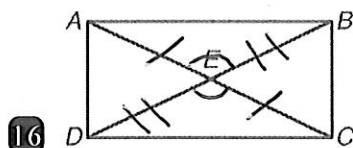
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If  $\overline{AD} \cong \overline{BC}$ , write a statement about point  $E$  that would allow you to prove  $\triangle AED \cong \triangle CEB$  by the SSS Postulate.

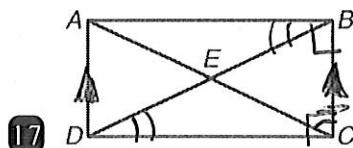
$E$  bisects

$E$  is the midpoint  $\overline{BD}$  &  $\overline{AC}$

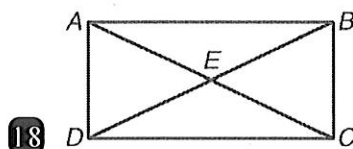


SAS

Suppose  $\overline{AE} \cong \overline{CE}$  and  $\overline{BE} \cong \overline{DE}$ . What postulate or theorem will allow you to prove  $\triangle BEA \cong \triangle DEC$ ?



Write True or False. If  $\angle ABC$  and  $\angle DCB$  are right angles and  $\overline{AD} \parallel \overline{BC}$ , you can prove  $\triangle ABC \cong \triangle DCB$ .

 $\overline{AB} \cong \overline{CD}; HL$ 

$\angle DAB$  and  $\angle BCD$  are right angles. Write a single congruence statement about two segments that would allow you to conclude that  $\triangle DAB \cong \triangle BCD$ . What theorem or postulate would justify the conclusion?

- 19 A triangle has vertices  $P(a, b)$ ,  $Q(c, d)$ , and  $R(e, f)$ . You are asked to prove that the image  $\triangle P'Q'R'$  of  $\triangle PQR$  after reflection across the  $y$ -axis is congruent to the preimage. What coordinates should you use for the vertices of  $\triangle P'Q'R'$ ?

$P'(-a, b)$   
 $Q'(-c, d)$   
 $R'(-e, f)$

Name: \_\_\_\_\_

ID: A

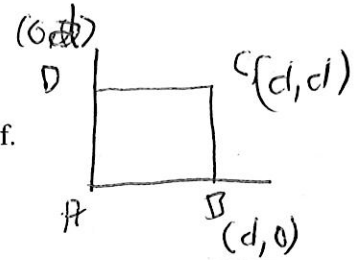
- 20 Assign variables as the coordinates and write a coordinate proof.

**Given:** Square  $ABCD$  with side length of  $d$  units

**Prove:**  $AC = BD$

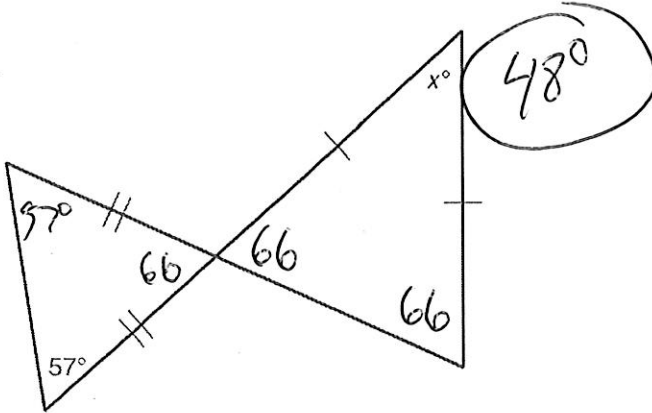
$$AC = \sqrt{(d-0)^2 + (0-d)^2} = \sqrt{2d^2} = d\sqrt{2}$$

$$BD = \sqrt{(d-0)^2 + (0-d)^2} = \sqrt{d^2 + (-d)^2} = \sqrt{2d^2} = d\sqrt{2}$$

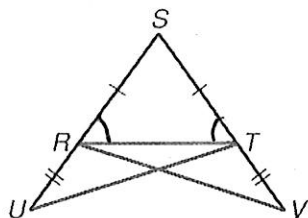


$$AC = BD$$

- 21 What is the value of  $x$ ?



22 Given:  $\overline{RU} \cong \overline{TV}$ ,  $\overline{RS} \cong \overline{TS}$



Prove:  $\overline{RV} \cong \overline{TU}$

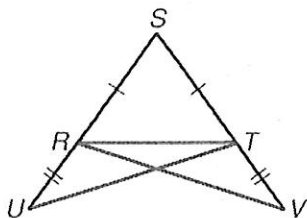
Proof:

Statements	Reasons
1. $\overline{RS} \cong \overline{TS}$	1. Given
2. $\angle SRT \cong \angle STR$	2. _____ ? _____
3. $m\angle SRT = m\angle STR$	3. Def. of $\cong \angle$
4. $m\angle RTV = 180^\circ - m\angle STR$	4. Lin. Pair Thm.
5. $m\angle TRU = 180^\circ - m\angle STR$	5. Lin. Pair Thm. and Subst. (Step 2)
6. $m\angle RTV = m\angle TRU$	6. Subst. Prop. of =
7. $\angle RTV \cong \angle TRU$	7. Def. of $\cong \angle$
8. $\overline{RT} \cong \overline{RT}$	8. Reflex. Prop. of $\cong$
9. $\overline{RU} \cong \overline{TV}$	9. Given
10. $\triangle RTV \cong \triangle TRU$	10. _____ ? _____
11. $\overline{RV} \cong \overline{TU}$	11. _____ ? _____

Isosceles  $\triangle$   
theorem

What reason belongs in Step 2?

23 Given:  $\overline{RU} \cong \overline{TV}$ ,  $\overline{RS} \cong \overline{TS}$



Prove:  $\overline{RV} \cong \overline{TU}$

Proof:

Statements	Reasons
1. $\overline{RS} \cong \overline{TS}$	1. Given
2. $\angle SRT \cong \angle STR$	2. _____ ? _____
3. $m\angle SRT = m\angle STR$	3. Def. of $\cong \angle$
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8. $\overline{RT} \cong \overline{RT}$	8. Reflex. Prop. of $\cong$
9. $\overline{RU} \cong \overline{TV}$	9. Given
10. $\triangle RTV \cong \triangle TRU$	10. _____ ? _____
11. $\overline{RV} \cong \overline{TU}$	11. _____ ? _____

What reason belongs in Step 11?

CPCTC